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BULLETIN

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JANUARY 1899

Four siphoneous Algae of the Pacific Coast

BY DE ALTON SAUNDERS

(PLATE 350.)

CODIUM MUCRONATUM CALIFORNICUM J. Ag. Till Algern. System. VIII., 44.

Pl. 350, fig. 1, a, b and c.

The plant forms rather dense tufts of indefinite extent which are very firmly attached to the rocks by numerous, creeping, rhizoidal filaments. The plant body is erect, dichotomously divided, 1.5–3 dm. high, .5–1 cm. in diameter, of a spongy consistency, composed of a central mass of irregularly branching filaments from which arises a compact mass of unbranched peripheral filaments; the young peripheral filaments are cylindrical, ending in an acute mucron; as the filaments mature they become clavate and the mucron shorter and more obtuse. Figs. 1, *b* and *c*.

The sporangia arise from near the base of the peripheral filaments, are sessile or subsessile, cylindrical or oval, 150–300 μ long and 60–120 μ broad.

This plant has been repeatedly collected on the Pacific coast and almost uniformly referred to *Codium tomentosum* * (Huds.) Stack. The peripheral filaments of the latter species are obtuse or rounded at the end, not at all mucronate and the cell wall is only slightly thickened.† (Fig. 1 *d*.) Moreover the sporangia of

* Harvey, Ner. Bor., 2: 28, Pacific coast localities only. Harvey, Not. Coll. Alg. made on N. W. coast, 161. Anderson, List, etc.

† Fig. 1, *d*, was drawn from No. 168 of Phyc. Bor. Am. specimen from the coast of Jamaica.

[Issued January 16.]

the true *Codium tomentosum* are elliptical, pointed at both ends, slightly thickened at the apex and shorter—200–290 μ long and broader, 80–140 μ broad—than in *Codium mucronatum Californicum*. Compare Fig. 1, *b*, *c* and *d*.

Recently Miss J. E. Tilden has issued this same species, collected at Vancouver Island, British Columbia.* A fragment of Miss Tilden's specimens were softened and figures 1–6 and *C* were drawn from a microscopical mount of it.

The plant is common all along the Pacific Coast from Sitka as far south at least, as the southern California coast.

CODIUM ADHAERANS (Cabr.) Ag. Spec. Alg. 457. 1820.

Aghardia adhaerans Cabr. in Phys. Sallsk. Arsbr.

Pl. 350, fig. 3, a, b and c.

The plant body of this anomalous species is an irregular, blackish-green, cushion-like, spongy mass from 1 cm. to 2 dm. or more in extent. It consists of a felt-like strongly adherent mass of creeping mycelial, branching filaments 2–8 mm. thick. From the upper part of the creeping filaments arises a mass of unbranched cylindrical or clavate, erect filaments which are 1 mm. or more long, and about 100 μ wide, very obtuse or truncate and slightly thickened at the distal end.

The sporangia are cylindrical, very obtuse, sessile or subsessile, 300–400 μ long and 50 μ wide, borne laterally near the distal end of the erect filaments.

This species is rare or local on the California coast. Collected at Point Pinos (the southern point of Monterey Bay), and at Point Lobos (ten miles south of the last locality); it seems to prefer the under side of overhanging rocks.

VALONIA OVALIS (Lyngb.) Ag. Sp. Alg. 1: 431. 1820.

Gastridium ovale Lyngb. Hydr. Dan. 72. 18. 1819.

Pl. 350, f. 2.

The plant consists of a single-celled obovate, thin-walled, inflated, sessile sack 2–8 mm. high and about as broad.

This delicate little plant was collected for three successive sum-

* Tilden, American Algae, Century III., No. 281.

mers from a single large, flat-topped rock, incrusted by a *Melobesia*, which at the lowest tide stood in a foot of water and was exposed to the direct washing of the waves, Point Lobos (Central California coast). It has previously been reported for the North Atlantic Ocean, Faroe Islands, Northern coast of Norway, and the Santa Cruz Islands.

DERBESIA VAUCHERIAEFORMIS (Harv.) J. Ag. Till. Alg. System VIII., 34.

Chlorodesmis? vaucheriformis Harv. Ner. Bor. An. III., 30. *t. 40. fig. D.*

Pl. 350, f. 4.

The filaments are tufted, light green, 1 cm. or so high, 30–40 μ broad; branches erect, few, 20–30 μ broad, obtuse at the apex, often with a cross-partition or a cuboidal cell near their union with the main filament. The sporangia are elliptical, obovate or pyriform, 140–200 μ long and 50–80 μ wide; zoöspores large, 12–20 in a sporangia.

This species was collected but once, at Point Lobos, the last of June, 1896, in the same locality as the last species. The plant is slightly smaller than the measurement given by Dr. Farlow* for the same species from the Atlantic Coast but agrees in all other particulars. Not only do the sporangial stalks possess a cuboidal cell but either a cuboidal cell or a cross-partition is usually found near the base of the vegetative branches.

In the size of the tufts and the diameter of the vegetative filaments this species is very similar to *Derbesia marina* (Lyngb.) Solier,† which perhaps should be considered as only a form of *D. vaucheriaeformis* as has been shown by Dr. Farlow! The sporangia of *D. marina* according to Solier's figures, are shorter stalked and the sporangia are oblong and elliptical and but little narrowed below. Unfortunately no measurements of the sporangia are given. If the two species should prove to be distinct there is no reason in writing the latter as Dr. Toni‡ has done, *Derbesia marina* (Lyngb.) Kjellman, Ishv. Alg. Fl., for Kjellman in that very monograph writes it *Derbesia marina* (Lyngb.) Solier and cites the article of Solier referred to above.§

*Farlow, Mar. Alg. New Eng. 60.

† Solier, Ann. Sci. Nat., III. 7 : 158, *pl. 9, figs. 1–17.*

‡ De Toni, Syl. Alg. 1 : 426.

§ Kiellman, Ishv. Alg. Fl., 387.

Explanation of Plate 350

FIG. 1, *a*, *b* and *c*. *Codium mucronatum Californicum* J. Ag. *a*, a single plant, reduced one-half. *b*, a young peripheral filament bearing sporangium, × 50. *c*, mature peripheral filament, × 50. *d*, a peripheral filament and sporangium of *Codium tomentosum* (Huds.) Stack.

FIG. 2. *Valonia ovalis* (Lyngb.) Ag., × 2. Attached to a *Melobesia*.

FIG. 3, *a*, *b* and *c*. Peripheral filaments bearing sporangia of *Codium adhaerans* (Cabe) Ag., × 50.

FIG. 4. *Derbesia vaucheriaeforme* (Harv.) J. Ag. *b*, a filament, × 20. *c* and *d*, early stage in the development of the sporangium, × 350. *d*, a mature sporangium showing zoöspore, × 350.

The figures were drawn by Miss Emma Williams.

New Plants from Wyoming.—V*

By Aven Nelson

Scirpus paludosus

Perennial from corm-like tubers, which bear short horizontal rootstocks that produce terminally other propagative tubers: culms moderately stout, erect, 4–8 dm. high, triangular, the two faces plane, the other narrower and somewhat grooved: leaves pale green, often equalling or even exceeding the culms, 5–8 mm. wide, glabrous, longitudinally nerve-grooved (11–25 nervures): involucral leaves 2 (possibly rarely 3), both much exceeding the inflorescence, the shorter from 5–10 cm. long, the other twice or thrice as long: spikelets 3 to several in a dense, terminal head, ovate or oval, 10–20 mm. long, 6–10 mm. in diameter: scales narrowly ovate, membranous, puberulent, light brown, two-toothed at apex, the midrib prolonged into an awn about one-fourth as long as the scale; bristles usually 2, twice the length of the akene; style about 8 mm. long, two-cleft for less than half its length; akene lenticular, broadly obovate, nearly 3 mm. long, tipped with a conical tooth, brown, the surface shiny, finely pitted under a lens.

This species is probably most closely related to *S. campestris* Britton, from which it is clearly separated by its remarkable tubers (subspherical, 10–25 mm. in diameter), to say nothing of the minor characters given in the description. It is a plant that thrives in the most pronounced saline soils. The first specimens were secured on Salt Creek, near Newcastle, July 30, 1896, but it seems to occur in all the strongly alkaline marshes in the southern part of the state as well. The best specimens were secured at Granger, Sweetwater County, from the salt-encrusted bed of a dry pond where it was absolutely the only vegetation. Some of the soil (?), where it was growing, was taken for analysis and found to contain more than 60% of soluble salts.

Type specimen in Herbarium University of Wyoming, no. 3874, Granger, July 30, 1897. Collected also on the Laramie Plains in the margins of the Soda Lakes that occur at intervals. The tubers are never absent; the growth is often luxuriant and where it is accessible cattle eat it with avidity.

* Professor Nelson has generously deposited cotypes of these plants in the herbarium of Columbia University.—Ed.

Sagittaria hebetiloba

Monoecious with the lower verticils fertile, scapes 1–3, 2–5 dm. high, simple: leaves several, apparently all similar; petioles about equaling the scapes, rather stout, blade large, 8–14 cm. long (including the lobes), curved on the margins, subacute, lobes short, rounded-obtuse, about one third the length of the rest of the blade: bracts linear-lanceolate, 15–20 mm. long, subscarious, greenish-veined, spreading or reflexed: flowers large, about 2 cm. across; inner perianth leaves white, obovate or orbicular, the outer oval, greenish-veined, scarious-margined: pedicels short, ascending, 10–25 mm. long, fertile and sterile about equal: stamens 15–25, filament scarcely longer than the anther, but slightly dilated at base: fruiting head globular, 10–14 mm. in diameter: akene about 2 mm. long, obovate, tapering gradually toward the base, winged on both margins and around the summit, more narrowly so on the side of the beak; beak oblique or erect, very short, merely a blunt tooth equaling the rounded summit of the body of the akene.

Possibly local, observed but once, growing half emergent in a warm spring bog. Type specimen no. 2763, Platte Cañon, Laramie County, August 27, 1896.

Lilium montanum

Bulb 15–25 mm. in diameter, depressed globose, its thick fleshy scales from ovate to broadly obovate: stems 3–4 dm. high, rather stout: leaves glabrous, dark green, but slightly lighter on the lower face, minutely roughened on the edges, alternate except the uppermost, the upper whorl of 5–7, a second whorl of fewer leaves occasionally present, from narrowly to broadly lanceolate, tapering but slightly toward the sessile base, 4–6 cm. long, smaller downward, the lower reduced to scarious scales: one-flowered on a comparatively stout erect peduncle which is scarcely longer than the subtending leaves; perianth segments ascending, tips not reflexed, elliptic-oblong, tapering gradually towards both ends, the apex terminating in a short obtuse tooth, the claw short and broad (margined) less than a third the length of the blade, from brownish-red on the inner face to orange-red on the other, the orange-colored base of the inner face dotted with numerous purplish-black spots: stamens and stigma purplish: capsules oblong-cylindric, 3–4 cm. long.

For some time I have suspected that this was new, but in the absence of abundant material I have tentatively held it either under the name of *L. umbellatum* or *L. Philadelphicum*, to both of

which it is related in some of its characters. It differs, however, from both in its stouter habit, broader leaves, single flower, broader bulb scales and floral characters. It has the leaf arrangement of *L. umbellatum* but even broader leaflets than *L. Philadelphicum.* Both of the preceding are found in dry soil while this occurs only in rich, shaded bog lands, mostly at subalpine (7000–9000 ft.) stations but sometimes in cold wet ground at lower altitudes. Secured at several points in this state and probably found in similar situations throughout the northern Rockies. Type specimen no. 4376 by Mr. Elias Nelson from Saw Mill creek in the Laramie Hills, July 1, 1898.

Abronia elliptica

Perennial from a thick, deep-set, semi-fleshy, branched root: stems several from the crown, ascending, the underground portion rhizome-like and scaly, leafy above, minutely viscid-pubescent, branched from the base only, the branches 1–2 dm. long: leaves fleshy, glabrous, somewhat wrinkled when dry, mostly elliptic, more rarely oval or ovate, obtuse at both ends or somewhat truncate or subcordate at base, 15–30 mm. long; petioles from 1–3 times as long as the blade: bracts of the involucre obovate, subacute, 8–15 mm. long, mostly 5 in number, greenish-white: flowers greenish-white, numerous in the cluster, the individual flowers inconspicuous, 15–20 mm. long, the tube slightly dilated upwards, limb small, lobes suborbicular, sinus narrow: fruit obscurely pubescent, turbinate, summit truncate or subcordate, the sides bearing five vertical wings with rounded obtuse summits, the central cavity of the fruit extending through them, about 7 mm. high; akene oblong, 3–4 mm. long, loosely sheathed by winged pericarp.

A very distinct species, readily recognized among those hitherto described. In habit, but not in size, it suggests *A. fragrans* Nutt., while in fruit character it belongs with the *A. latifolia* group. It is of frequent occurrence in south-central Wyoming on the white desert-like, Cretaceous clay slopes of the Red Desert and other similar regions. Type specimen in Herbarium University of Wyoming, no. 3024, Green River, May 30, 1897. Excellently fruited specimens from Medicine Bow, July 9, 1898, by Mr. Elias Nelson.

Arenaria Uintahensis

Perennial, caespitose, the numerous, spreading branches of caudex sub-ligneous: leaves chiefly basal on the crowns, numerous, in fascicles, glabrous, narrowly linear, acerose, 1–2.5 cm.

long: stems 1, or sometimes 2, from each crown, glabrous below, minutely glandular pubescent above, slender, erect, 10–15 cm. long, few-leaved, nodes not conspicuously swollen, the lower internodes equaled by the leaves, the upper several times longer than the leaves: cyme loose, primary pedicels 10–25 mm., secondary 5–10 mm. long: sepals narrowly ovate, acute, nerveless, scarious, obtusely keeled by the broad, green midrib: petals oblong, obtuse, about 5 mm. long, 2 mm. broad: capsule hardly equaling the sepals, about as long as the divaricate styles, ovate, splitting into ovate, obtuse valves: seeds suborbicular.

Probably nearest to *A. capillaris* Poir from which its stouter habits, its acuminate sepals and its subequal sepals and petals most obviously separate it.

It occurred along the loose shale of the higher bluffs overlooking Bear River, and did not seem to be at all abundant. Type specimen in Herb. University of Wyoming, no. 4640, Cokeville, Uintah Co., June 11, 1898.

Aconitum ramosum

Stem 3–5 dm. high, simple below, more or less branched above, the branches ascending, nearly or quite glabrous below, increasingly finely glandular-pubescent upwards: leaves suborbicular in outline, 5–8 cm. in diameter, 3-, or more rarely, 4-parted, the divisions deeply 2- or 3-cleft, these incised, the segments oblong-lanceolate, acute: flowers medium size, sparsely short pubescent; hood 12–16 mm. long, obovate (exclusive of the beak) tapering but slightly toward the obtusish base, beak short, porrect, sub-acute; lateral sepals as broad as long, unequilateral; lower sepals oblong or broadly spatulate, ¾ as long as the lateral and from ¼ to ⅓ as wide; follicles cylindric-oblong, 15–20 mm. long, reticulately veined, nearly glabrous.

When this plant was secured its strikingly *Delphinium*-like leaves and some other characters led, in the absence of any specimen of *A. delphinifolium* DC., to its being distributed under that name. During a recent visit to the Missouri Botanical Garden, an examination of the specimens in the Herbarium shows that *A. delphinifolium*, that plant of the far Northwest, is a very different thing from this. This is strict and has fewer, larger leaves with fewer and longer segments, a very different pubescence as well as some differences in flower and fruit characters.

Secured but once, no. 2549, in open grassy ground in a park

on Limestone Range, Black Hills, Weston Co., near the South Dakota line, July 30, 1897. Here it occurred in great profusion though in a day's drive through that region it was met with but once.

Astragalus brevicaulis

Caespitose, the spreading leaves forming a small mat 8–12 cm. in diameter, appressed silvery-pubescent throughout, perennial from a small, vertical woody tap-root which bears at its summit a caudex of a few short, thickish branches: leaves crowded on the crowns, the persistent stipules and petioles clothing the branches of the caudex; leaflets usually 5, closely approximated at the end of the slender, 2–4 cm. long petioles, from obovate to oblong, 5–10 mm. long: peduncles exceeding the leaves, 1–several-flowered, prostrate-ascending; flowers purple, large for the plant; calyx purplish, campanulo-cylindric, tube about 5 mm. long, generally split nearly to the base by the developing pod, teeth about half as long: banner 15 mm. long, blade orbicular, 10 mm. in diameter; wings nearly as long as the banner, blade oblong, 2-lobed at apex, the basal lobe large, paralleling the long slender claw; keel shorter, rounded-obtuse: pod minutely pubescent, sessile, 2-celled or nearly so, falcate, deeply sulcate dorsally, cross section obcordate, 15 mm. or more in length, 4–5 mm. broad: ovules 20–30; seeds fewer.

This species seems to be most closely allied to *A. calycosus* Torr., but its purple flowers, larger falcate pod will serve for its immediate separation. It is a rare plant of the desert region of southern Wyoming, occurring sparingly on gravelly ridges. Type specimen no. 4601, from near Ft. Bridger, June 9, 1898.

Astragalus junciformis

Perennial from a deep-set root, the caudex slender-branched, cinereous-pubescent: stems usually several, more or less paniculately branched throughout their length, 2–4 dm. high, often somewhat striate: stipules small, triangular; leaves either reduced to a naked, slender petiole and rachis, 4–7 cm. long, or bearing 5–7 distant, linear-oblong leaflets, 8–15 mm. long: peduncles equalling or exceeding the leaves, from very few- to many-flowered; flowers about 10 mm. long, orchroleucous: standard short and broad, almost reniform, the claw short; keel broad with an elongated but blunt apex: calyx pubescent with intermingled dark hairs, campanulate, teeth minute: pod strictly one-celled, neither suture much thickened, compressed, linear-oblong, straight, probably about 3 cm. long (fully mature legume not a hand), pubescence similar to that of the stem; pedicels short, di-

varicate or reflexed (probably all ultimately reflexed): ovules reniform, rather large, nearly filling the pod.

This in habit suggests *A. junceus* Gray, but possibly it is more closely allied to *A. Coltoni* Jones. Its junciform stems and leaves are very characteristic. So far I have found this species in but one locality, viz., near Point of Rocks, Sweetwater Co., where it is an occasional plant on sandy, stony slopes. First secured in 1897, no. 3081 and again, 1898, no. 4839. It comes into blossom early in June.

Astragalus exilifolius

An acaulescent perennial from large, deep-set roots; caudex multicipital, closely caespitose: leaves densely crowded on the crown, simple, narrowly linear, the petiole-like base almost filiform, 2–4 cm. long, pungently acute, sparsely short hirsute, the dead leaves persisting for a time on the branches of the caudex: stipules scarious, ovate, imbricated, the largest 5 mm. long: peduncles about equaling the leaves, 1–2-flowered; pedicels short, bracts small, scarious: calyx campanulate, glabrous, or nearly so, its lobes subulate, shorter than the 3–4 mm. long tube: corolla showy, 15–20 mm. long, white, the keel tipped with purple: pod sessile, 1-celled, oblong, slightly curved with an acuminate apex, purple mottled, 12–15 mm. long, both sutures prominent, the ventral sharply keeled; seeds few (1–4).

This adds one more member to the section in which *A. spatulatus* Sheld. and *A simplicifolius* Wats. are the conspicuous members. The characters of this separate it more sharply from both of those than they are separated from each other.

It is of the desert region of south-central Wyoming, occurring as rounded tufts on the barren clay ridges of the Cretaceous formation. Type specimen, no. 4493, by Mr. Elias Nelson, Freezeout Hills, Carbon County, July 10, 1898. Collected also in the Rattlesnake Hills, no. 4996.

Astragalus aculeatus

Perennial, the stout woody caudex bearing numerous, slender, appressed-caespitose branches, hardly rising above the surface of the soil, the mats from one to several decimeters in diameter: leaves numerous, crowded on the short stems the bases of which are covered with the persistent dead ones: leaflets 5–7, linear-oblong, plane, involute or somewhat channelled, pungently long mucronate, about 8 mm. long, green but under a lens sparsely

hirsute: stipules scarious hirsute on the margins: peduncles about equaling the leaves, from 2–several-flowered: flowers purple, 5–6 mm. long: calyx campanulate, the slender lobes equalling the tube, hirsute, usually some black hairs intermingled: banner broadly obovate, wings elliptic: pod 1-celled, sessile, narrowly ovate, acuminate, hardly exceeding the calyx-lobes.

It seems to be nearest to *A. Kentrophyta* Gray but is distinguished at once by its matted habit, its green leaves, its purple, peduncled flowers as well as by its habitat. This is strictly alpine, forming mats below the snow drifts at the upper limits of vegetation. Type specimen, no. 2445, from the higher summits of the Big Horn Mts., near Dome Lake, July 18, 1896.

I am again indebted to Dr. Rydberg for a comparison of the co-types, sent to Columbia University, with specimens of nearly related species. Most of them I also personally studied critically at the Herbarium of the Missouri Botanical Garden. Of these, as well as of those published in previous papers, representative specimens will be placed, whenever possible, in other herbaria including Mo. Bot. Garden, Gray, National, Cornell, etc. The types are all preserved in Herb. University of Wyoming.

Mycological Notes.—IV

By Byron D. Halsted

Mould of the Paeonia.—During the last week of May a most remarkable development of *Botrytis vulgaris* Fr. was met with upon garden paeonias. At that time the plants were in an apparently vigorous condition; they were pushing their flower stalks and the buds beginning to show pink color. While the outer leaves of the clumps were in a healthy condition all the inner ones hung brown and lifeless upon the stems and were overrun with a surprising growth of *Botrytis.*

This fungus is not uncommon upon the old leaves late in the season and the flowers may show it occasionally; in fact no. 2459 of Ellis and Everhart's N. A. Fungi is this species collected upon paeonia petals by Dr. Kellerman.

In the present instance the fungus was playing no saprophytic rôle, but flourished as a parasite upon the rank spring herbage of the host and, at the time examined, was spreading upon the outermost leaves of the clusters. It seems to be a clear case of an unusual outbreak of a comparatively harmless paeonia fungus destroying all the foliage that was not directly in sight.

The conditions favoring this are the many rainy days that preceded the time of the inspection, there having been eighteen out of the twenty-eight upon which showers had fallen, and the excessive cloudy weather—the month up to that time having a record of twenty dark days.

The writer has had no better illustration of the influence of rainfall and consequent absence of sunshine upon fungous growth, for in this case only the outermost leaves exposed to the sun and air were healthful, while all within the umbrella-like cover that these made were dead or dying and literally covered with a dense growth of conidiophores and the multitudes of spores. The young foliage that otherwise might have been normal was destroyed by the *Botrytis* that had been highly favored by continued moisture, lack of sunshine and the confinement of the spore-laden air in the interior of the clumps.

Rust of Phlox subulata.—*Phlox subulata* L. grows quite abundantly upon the red shale cliffs in the vicinity of New Brunswick. As its name suggests it is a prostrate plant sending up short flower stalks in very early spring. By the first of June it is like a mat of moss upon the exposed places where it grows.

Attention was attracted to this plant upon a recent botanical excursion by the more upright habit of some of the specimens. A closer examination revealed the fact that they were attacked by a rust. In passing it may be stated that low creeping plants are quite apt to have the stems more upright when infested by a rust.

The rust in question is quite different microscopically from *Puccinia plumbaria* Pk., that is found upon *Phlox divaricata* L., *P. longifolia* Nutt. and *P. Douglasii* Hook., but agrees closely with *Puccinia Gileae* Ell. & Hark., as found upon *Gilia divaricata* Torr., *G. squarrosa* H. & A. and *G. intertexta* Steud.

Dr. Kelsey has distributed it upon *Phlox Richardsonii* Hook. from Helena, Montana, and is given upon *P. caespitosa* Nutt. var. *condensata* Gr. in Farlow's Host Index.

So far as is learned from the locality of the hosts and the specimens of the species in the herbarium, namely: From California, collected by Dr. Harkness, the author of the species, upon *Gilia divaricata* Torr., two specimens from Moses Craig, Corvallis, Oregon, one upon *Gilia squarrosa* H. & A., and the other upon *G. intertexta* Stend., and the specimens from Dr. Kelsey, collected at Helena, Montana, upon *Phlox Richardsonii* Hook., it would seem that the species of rust is particularly a far western one, and the present find extends its range to the Atlantic coast.

The so-to-speak eastern rust of the *Phlox*, *Puccinia plumbaria* described by Peck in volume six of the Botanical Gazette and mentioned for Illinois by Dr. Burreell, also reaches across the continent, for Dr. Harkness collected it in California upon *Phlox Douglasii* Hark. Thus the two species are widespread in the United States and probably not as yet found elsewhere.

Sun-exposed Leaves and Blight.—That the leaf blight (*Cylindrosporium padi* Karst.), is often more abundant upon one half of the cherry leaf than the other, has been a matter of observation for years and the cause of the peculiarity was not determined in the writer's case at least, until recently, when after an inspection of fifty

trees the fact of the relation of sun exposure to the development of the blight became known.

The first theory employed was the position of the leaf upon the twig, but there were so many exceptions to the rule that the latter was not established. The cherry leaf has a way of bending the two halves of the blade upward so that the underside of the leaf is the only one in sight and may be unequally exposed accordingly. Such leaves upon any tree hang in all possible positions in relation to the sun, but taking a tree as a whole, there is a shady and a sunny side. In like manner there are some of the leaves so posed that one of the upturned halves is southward. When such leaves are situated upon the south side of the tree the conditions are fulfilled for the production of an instance when the fungus of the leaf is largely confined to the sunny half.

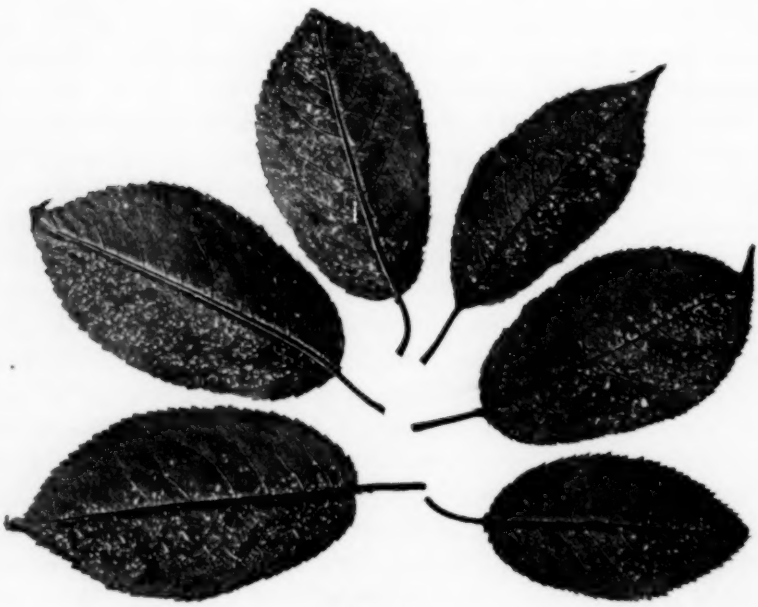

FIG. 1.

The observations were made in part upon small trees and the observer's eye could take the position of sun, that is, the rays of sunlight at mid-day were parallel to the line of vision when the

person was so placed as to see the greatest abundance of the fungus upon the leaf in question or in fact upon the whole tree.

How the excess of blight is brought about by this exposure is not demonstrated for it may be that the position, unnatural in part at least, brings about a scalding or burning of the tissue of the underside of the leaf, which is reasonably assumed to be less hardy than that of the upper side; and this in turn, might prepare the way for the better entrance of the germs or their more vigorous growth after once within the leaf, already partially devitalized. It is possible also that the sunny side may furnish the more favorable conditions of warmth, etc., for the development of the blight. Fig. 1 shows some instances of cherry leaves that have a large majority of the spore spots of the blight fungus upon one-half of their underside. The three upon the right hand were from the southwest side of the tree and the other three from the southeast side.

Influence of Fungi upon Fruitfulness of Host.—While inspecting the asparagus fields in New Jersey for the prevalence of the rust, one fact came out that is seemingly contrary to a general law of vegetable physiology, namely, the influence the rust seems to have upon fruitfulness. In the years before the rust made its appearance the autumn "brush" of the pistillate plants were heavily loaded with berries, and late in the season the ripened fruit gave a bright red coloration to the field. During the present season the berries are very few indeed, and nearly all the plants appear as if they were staminate.

It is safe to assume that the rust since its first appearance in 1896 has weakened the plants, making the crop of spring smaller than usual and materially reducing the size of the autumn growth.

In other words the plant's life was in jeopardy and as a consequence an increased tendency would be expected toward fruitfulness. When the life of an individual is in danger there is an attempt, as a rule, to reproduce by seed.

This exception to the general rule does not seem to arise from the rust actually blighting the flowers, but upon the other hand, the blossoms did not form and the great majority of the plants showed no signs of reproduction.

The Trenton Goldbach poison Case.—On Saturday, October

13th, Herman Gebhardt, a workman in Trenton, N. J., went nutting to Crosswick Creek near Bordentown, and while there gathered some fine specimens of a toadstool. When near his home he went into a butcher shop kept by Harry Goldbach to have his walnuts weighed. He exhibited his mushrooms, as he thought them to be, and Goldbach was attracted by them and bought a quantity. Gebhardt took the remaining ones to his boarding place and asked his landlady to have them prepared for his supper, but his wish was not granted, it being late and inconvenient, and he carried them to Walters' saloon near by and were placed behind the bar until morning where Mrs. Walters seeing them, removed the lot of six or seven toadstools and burned them. From a conversation with Mrs. Walters and her description of the size and color of stipe, cap, gills, etc., it was quite clear that the species was *Amanita phalloides* (L.). This view was confirmed by Mr. V. K. Chestnut of the U. S. Department of Agriculture, who with Gebhardt visited the place where the toadstools were gathered and saw other specimens, which Gebhardt pronounced to be of the same kind that he had sold.

The specimens obtained by Goldbach were cooked upon Sunday morning and eaten by the whole family of nine except Max Goldbach. In a talk with the County Physician Rogers and the other physicians in charge of the cases it was learned that the first symptoms of poisoning were observed on Sunday evening when violent vomiting set in with all the eight who partook of the toadstools, and it was very prolonged. On Monday night all became worse the leading characteristic being as stated great weakness. Early upon Tuesday morning Mrs. Goldbach and her eight-year-old son died at nearly the same time, and at four o'clock in the afternoon the father died after great agony.

At the time of my visit four other victims were prostrated and in a very weak condition, while a two-year-old child had entirely recovered. Later advices indicate that all except the three previously mentioned will recover.

Fungus prolongs the apparent Vitality of Host.—During the autumn months a smut (*Ustilago Rabenhorstiana* Kuehn) is common upon the crab grass (*Panicum sanguinale* L.) and doubtless has a material effect in reducing the amount of seed produced by

the weed. There is a very striking difference between the normal and the infested plants that renders it an easy matter to distinguish them. The smutted specimens, invariably the whole plant, are much more leafy and the inflorescence rarely comes to view, but remains as a plump mass of black spores inclosed by the uppermost leaves.

One of the points of interest connected with the smutted *Panicum* is the fact that it remains green long after the healthy plants have turned brown or lost their leaves. In going over a field covered with the crab grass in late October the smutted plants are quickly detected by the profusion of leaves of a deep green color. Such plants often send out new roots at the joints, as if making a desperate attempt at fruitfulness in spite of the smut that changes each flower cluster into dusty spores as soon as it is formed.

From the nature of the smuts generally and the observed facts in this case, it is probable that the infection takes place while the plants are quite young and the fungus afterwards infests all portions.

Early in the life of the plant the habit of growth is changed, and the fungus reaches the full fruitful condition before it is visible. It is only in the advanced stage of the disease that the mass of spores comes to view by the separation of the leaf bases that previously hid it from sight. In the normal plant the stem elongates and carried up the forked inflorescence, but here the stem remains short with its tip inclosed within enlarged leaves that are of darker green than the healthy plants. This same dark green is characteristic of the turnip plant that is having its roots destroyed by the club-root fungus—a very conspicuous shade of green to those who recognize it.

One Fungus develops in the Host Immunity from another.—In a recent collecting tour it developed by inspection that the rust *Puccinia mamillata* Schrt., while common upon the ordinary plants of the climbing smart weed (*Polygonum dumetorum* L.) it was nearly absent from all those infested with *Ustilago anomala* J. Kunge. It would seem that the smut had taken possession of the plant and the latter did not longer furnish the proper feeding ground for the rust. The same thing was found true in case of the smutted specimens of *Panicum sanguinale* L., the leaves of

which are rarely affected with *Piricularia grisea* (Cke.), while the normal plants have the foliage quite generally spotted with it.

In a bed of fruiting radishes the writer had also noticed that certain plants will have the inflorescence malformed by the *Peronospora parasitica* (Pers.), while others close at hand were victims of the *Cystopus candidus* (Pers.); but it is rare that a flower or seed vessel bears both of these common fungi. To a limited extent it would seem that the radish infested with the white mould is immune from the mildew, which is generally considered as its general associate and because of the supposition that it feeds upon the *Cystopus* it has received *parasitica* as the specific portion of its name.

If the observations were extensive enough the statement possibly might be made that a wheat, rye or out plant afflicted as it is, if at all, with smut from a seedling on, would be at least partially immune from the rust. The smut gains entrance to the seedling and possibly renders the host unsuited to the entertainment of other fungous guests.

Effect of leaf Fungi upon autumn Coloration of Foliage.— Very striking illustration of the effect of leaf fungi upon the autumnal coloring of foliage was met with this year in the case of a tree of the hard or sugar maple (*Acer saccharum* Marsh). The leaves were mottled green and pale lemon yellow, particularly those upon the lower and inner branches, while the upper foliage of the tree and that exposed more fully to the sun was nearly uniformly yellow. It would seem from an inspection of the tree that the mottling was associated with shade and perhaps the coolness and longer periods of moisture that attend the protection of the foliage from the direct sunshine.

The spots upon the otherwise yellow leaves were of all sizes but averaged a half inch or so in diameter and were of a green color, irregular in outline and disposed without order, some leaves having but one green blotch while others had nearly the whole area occupied by them. Fig. 2 shows a leaf with the blotches. The color values of green and yellow are so nearly the same as to make it difficult to get a sharp photograph of the spots.

A microscopic examination of the under surface of the mottled leaves showed clearly that a fungus was invariably associated with the blotches, it being the common maple mildew (*Uncinula circi-*

nata C. & P.). It was interesting to note that, in the present stage of the fungus, a few mature perithecia were to be found at or near the geographical center of the blotch, usually along side of a vein and the hyphae extended radially to the margin.

FIG. 2.

The fungus, judging from the size of the perithecia, must needs have been upon the leaf long before any discoloration began to take place and probably had spread to the full extent of the blotch before its presence could have been detected by the autumn discoloration.

Much of interest centers in the action of the fungus upon the portion of the host that is under its immediate influence. Whether it renders the affected protoplasm sluggish so that the chlorophyl is not withdrawn, or the cells more active by supplying them with the proper nourishment and the work of synthesis goes on as usual, are conjectures simply and no explanation of the peculiar phenomenon in question. To look at the leaves it would seem to be a case of symbiosis of the mutualistic sort.

Late Growth of Bean Mildew.— *Phytophthora phaseoli* Thax., upon the Lima bean is remarkable in that it thrives upon the pods after the plants are killed by the frost. Upon October 24th, the writer could have picked from one large field bushels of pods in all stages of growth that were badly infested with the mildew and in a very flourishing condition. It is true, however, that while the foliage of the beans was destroyed by the frosts the pods remained apparently untouched, and therefore the tissue upon which the fungus grows is uninjured. The facts remain, nevertheless, that this *Phytophthora* grows luxuriantly in the cool weather of late autumn.

A new Species of Lacinaria

By H. Ness

(Plate 351.)

Lacinaria cymosa

Perennial from globular or oblong tuberous root 1–2 cm. in diameter: stem slender, erect, rigid, 35–45 cm. high, corymbosely branched above, leafy puberulent throughout: leaves smoothish and minutely punctate; the radical and lower cauline 15–20 cm. long and 1–1.5 cm. wide, lanceolate and tapering at the base to a clasping petiole; the upper sessile, linear, and gradually smaller: inflorescence a simple or, on stronger specimens, a compound cyme; heads about 25 mm. high, with about 20 purplish-red or pale-purplish flowers; involucre about 2 cm. long, oblong-cylindrical; scales numerous, closely imbricated in about six series, puberulent and ciliate-margined, with rounded or almost truncate, appressed, and often slightly mucronate apices; the outer orbicular to oblong; the inner oblong to linear with dark-purplish tips: pappus purplish, plumose, shorter than corolla-tube, but about equal to the achenes; the corolla about 15 mm. long, smooth inside, with lanceolate, obtusish spreading teeth; stamens included, with the usual notched terminal appendages; style exserted, the branches flat, dilated upwards, and several times longer than the short purple-colored stigmatic lines; achenes oblong, about 8 mm. long, 10-ribbed, hispid on the ribs.

This plant was found during October, 1896, one mile south from the Agricultural and Mechanical College of Texas, growing in a limited number over about two acres of ground, where the stiff clayey soil is so poor that only a few species of grass dispute the ground with it. I have not been able to find it in any other place. In the following autumn, when the spot was again visited, for the purpose of obtaining more specimens, I found that the plants had apparently increased in number, and were spreading beyond the area where they were first discovered.

This species differs from the other species of *Lacinaria* in having a rather loose, corymboid cyme, reminding one of *Vernonia*. In the heads it somewhat resembles *L. cylindracea* Michx., having about the same number of flowers and a somewhat similar invo-

lucre ; the scales are larger, however, more appressed and less distinctly mucronate. It also differs from that species in having the corolla smooth inside, and the leaves more distinctly punctate.

Explanation of Plate 351.

FIG. 1. Floret.
FIG. 2. Stamens.
FIG. 3. Radical leaf.

TEXAS AGRICULTURAL COLLEGE.

Proceedings of the Club.

TUESDAY EVENING, OCTOBER 11, 1896.

There were thirty-one members present. President Brown in the chair.

One nomination for corresponding membership was reported by Dr. H. H. Rusby, of Dr. Manuel Gomez de la Mazo, University of Havana, Havana, Cuba.

The evening was devoted to informal reports of summer observations and experiences. The Secretary spoke of collections in the White Mountains, and on the Massachusetts Coast and near Lake Erie. He reported the discovery of a locality for *Aster phlogifolius* in fine typical development at Pelham Manor, adjoining New York City.

Dr. Britton spoke of the progress made at the Botanical Garden, especially in the advancement of the museum building, and reported the prosperous condition of the herbaceous grounds, now with over 2,700 species, a mass of bloom during the season. One day in July the visitors to the grounds numbered 4,000. Interesting questions of specific identity are being confirmed by cultivation at the garden, as in case of *Potentilla pumila*.

Dr. Britton also announced the forthcoming scientific expedition to Porto Rico, Mr. A. A. Heller going as botanist under the auspices of the New York Botanical Garden through the liberality of Mr. Cornelius Vanderbilt.

Dr. Underwood reported collections in the forests of Thüringen and examination of fern types at Berlin and Kew. He referred to the excellent preservation of the plants of Willdenow at Berlin, and to the strength of the Berlin herbarium, enriched among the ferns by the annotations of Prantl, the collections of Mettenius, Maximilian Kuhn, and the Hawaiian herbarium of Hildebrand. Dr. Underwood described the botanical garden laid out by Professor Engler in Berlin, exhibiting modern ideas of geographic distribution. He also spent some weeks at Kew.

Dr. Rusby reported a summer spent largely in procuring material for the study of drugs in powdered condition. Drugs now

come chiefly to the pharmacist powdered, and adulterants are less easily recognized.

The search for genuine *Apocynum cannabinum*, with broad, thick leaves, woolly beneath, has proved disappointing, *A. album*, with recurving habit, replacing it in the region about New York City. Dr. Rusby also reported the rediscovery of *Euonymus atropurpureus*, rare near New York, found near Little Falls, N. J., at an excursion of this club in June last.

Mr. A. A. Heller spoke of his experience in the Olympic Mountains, where the continuous rains interfered with collections. Ferns grew in great profusion and often five feet high, but of few species. The Salmonberry varied from yellow to deep red, and was often an inch in diameter, on bushes ten feet high. *Oxalis Oregana* made a fine display, as also several species of *Vaccinium*, *V. parvifolium* with red, and *V. ovalifolium* with blue berries. An introduced blackberry, *Rubus laciniatus*, is now well established there, blooming from July to Christmas, and known as the Evergreen Blackberry. *Spiraea Menziesii* grew up by the streams, with its rose-colored spike a foot and a half high. *Lilium Columbianum* appeared in the meadows. There were not many representatives of any family; only about twenty composites out of 230 plants collected, of grasses about thirty-five. In August and September Mr. Heller collected in Texas and Arkansas with marked success.

Professor Lloyd reported a summer spent in study in the laboratory of Professor Goebel, at Munich, and commented upon the botanical garden there, which, although of but a few acres, is exceedingly well arranged for educational purposes.

Dr. M. A. Howe reported work on the hepaticae, and his discovery, on a hemlock stump in the New York Botanical Garden, of genuine *Cephalozia connivens* for the first time in the United States, the plant distributed by Austin under that name proving a different species.

Dr. Small spoke of work in Tennessee, and Mrs. Britton in the Adirondacks and elsewhere. Miss Ingersoll exhibited photographs of *Cypripedium spectabile*. Miss Sanial called attention to the color variation in *Monotropa uniflora* at Sterling, New York, where she found a region in which all the specimens were pink·

Mr. Clute reported work on the sand barren flora of eastern Long Island. Among his collections were *Dryopteris simulata*, only once before recorded from New York State; *Kneiffia Alleni*, new to North America; *Pogonia verticillata*, in quantity near Southampton; *Kalmia latifolia*, within twenty-five feet of the sea-level; *Potentilla pumila* and *P. Canadensis* growing together without intermediate forms.

Discussion regarding violets followed. Professor Britton exhibited some fresh flowers of *Viola cucullata*, borne on peduncles normally cleistogene, and with some of the flowers transitional in character. President Brown spoke of similar flowering in *V. sagittata*. Dr. Britton and the secretary reported their collecting cleistogenes of *V. Atlantica* this season for the first time.

Mr. Clute spoke of his study of the cleistogenes in *V. cucullata*, *V. ovata*, *V. rostrata* and *V. Canadensis*, and of their development during the heat of summer. He observed the need of cool temperature to secure free flowering in *Viola*, as also seen in the greenhouse cultivation of pansies. Mrs. Britton called attention to the continuous summer blooming of *V. tricolor* in the cooler climate of the Adirondacks and of the Alps. Mrs. Britton also reported the collection at Lake Placid of *Viola arenaria*, for the first time in New York State.

WEDNESDAY EVENING, OCTOBER 26, 1898.

The evening was one of severe and continuous rain and ten persons only were present.

In the absence of other officers Professor Underwood presided.

The resignations of Miss Amy Schüssler and of Mr. Wm. C. Witter were accepted.

Dr. Underwood was made chairman of a committee to make arrangements for courtesies to visiting botanists of the Society for Plant Morphology and Physiology at its approaching session at Columbia University, beginning December 27. He was empowered to select his associates on the committee and to report at the next meeting of the club.

The scientific program consisted of a paper by Mr. W. A. Bastedo on "The Pharmacology of Sassafras," read by title in the absence of its author; and a paper by Dr. N. L. Britton on "A

new *Helianthus* from Long Island." Dr. Britton told the story of the discovery of this new species, which appears to be an ally of *H. Maximiliani* of the West, and which was found by Dr. Britton, near Sag Harbor, on July 16, 1898.

Dr. Underwood discussed the too prevalent neglect of rootstock characters, seldom represented in herbaria, but often widely separating species otherwise too closely grouped together, as in *Struthiopteris* and *Onoclea*.

Miss Ingersoll called attention to potatoes exhibited at the instance of Dr. Rusby. These tubers were themselves penetrated to the center by tuberous rootstocks apparently of *Cyperus esculentus*.

NOVEMBER 8, 1898.

There were twelve persons present. Mr. A. A. Heller in the chair, in the absence of the regular officers.

Dr. Underwood reported as his associates upon the committee for entertainment of visiting botanists of the Society for Plant Morphology and Physiology at its first visit to New York on December 29 and 30, the following names: Dr. Britton, Dr. Rusby, Professor Burgess and Professor Lloyd.

The papers due were the following:

Mr. Marshall A. Howe, "Remarks on some undescribed Californian Hepaticae."

Mr. George V. Nash, "New and noteworthy North American Grasses."

Their authors being absent, and but a small attendance present, it being election night, they were on motion postponed to the next meeting.

Mr. A. A. Heller reported from the recent Staten Island excursion that *Baccharis* was found in very handsome fruiting state near the beach, and tall specimens of *Azalea viscosa* reaching twelve feet.

Dr. Underwood suggested that the Field Committee continue Saturday excursions later, on account of the interest attaching to winter stages of the higher plants and especially to the numerous lower plants for which the best collecting time is from October to May.

NOVEMBER 30, 1898.

Eighteen persons present. President Brown in the chair.

The following nominations for membership were made: By Dr. N. L. Britton, Dr. Joseph J. Sleeper, 104 West 83d Street; By Dr. Underwood, Mr. Tracy E. Hazen, Columbia University; Miss Mary A. Nichols, 256 West 84th Street.

The club listened to the following reports:

In behalf of the committee on entertainment, Dr. Underwood reported in favor of extending a reception to the Society of Plant Morphology on the evening of December 27.

Dr. Britton reported a communication from Mr. C. L. Pollard announcing the recent foundation of the Washington Botanical Club, and moved that as a club we tender it our greeting through our Secretary. This was adopted and the Secretary accordingly communicated this greeting to the Washington Botanical Club.

Discussion was called up by Dr. Britton relative to the program from the Field Committee. It was agreed that an opportunity for field meetings be provided on Saturdays after the first of January, for the purpose of studies of cryptogams and of winter stages of higher plants.

The scientific program followed.

The first paper was by Dr. Marshall A. Howe, "Remarks on some undescribed Californian Hepaticae," and consisted of the description of three new species, soon to be published. Beautiful plates illustrating these species were exhibited, the work of Dr. Howe, which with others will form a forthcoming volume of the Memoirs of the Torrey Club.

The second paper was by Professor Francis E. Lloyd, on "The Nucleus in certain Myxomycetes and Schizophyceae." Mr. Lloyd remarked that the work of Strasburger (1884) and later of Lister, gives evidence that the nucleus of the Myxomycetes is a definite organ possessed of a nuclear membrane, and containing chromatin. During cell-division, the chromatin is segregated into rounded masses lying in the nuclear plate; a spindle is formed. After the formation of a fine nuclear membrane about the daughter nuclei, the spindle fibers gradually disappear. The small number of these parallel fibers and absence of a cell-plate led Strasburger to

compare the nucleus to the animal rather than the plant type. Precisely similar conditions are, however, found in some plant cells.

The presence of a nucleus in the Schizophyta has been a point of controversy. Bütschli asserts the nuclear character of the central body, and regards the red granules as chromatin. A. Fischer denies the accuracy of the former's conclusions, the question remaining an open one. When our knowledge is complete it is highly probable that the nucleus will be found to be of the distributed type, of a type therefore comparable to that of the simpler protozoa. In any case the nucleus of the lower plants is much more primitive than that of the Myxomycetes. We are led therefore to regard these curious, much-debated forms, the Myxomycetes, as either plants of a higher type than the Schizophyta which have degenerated, or as animals related probably to the Sporozoa. For the former view there is now little evidence.

The secretary addressed the club briefly regarding the discarded species *Aster gracilentus* T. & G., and exhibited its type to the members. This formed a sheet of the herbarium of M. A. Curtis, now at Princeton, and was exhibited through the courtesy of Professor Geo. Macloskie of that university.

Dr. Howe exhibited a number of examples of *Wolffia*, discovered floating in Van Cortlandt Lake, constituting the third recorded collection within New York State of this minutest of flowering plants.

Dr. Britton reported two interesting additions to the collections of the New York Botanical Garden:

1st. A valuable collection of photographs and apparatus illustrating the cultivation of the poppy in Asia Minor.

2d. A gift from Mr. Peter Barr, the English horticulturist, of a collection of *Narcissus* and *Paeonia* for planting in the Botanic Garden. The claim of free entry as museum material was at first refused by the New York Custom House, but after five different appeals, the final decision was that the material was proper to an outdoor museum, and free entry was granted.

EDWARD S. BURGESS,
Secretary.

Index to recent Literature relating to American Botany.

Alden, F. W. *Pycnanthemum lanceolatum* Pursh. Pharmaceutical Rev. **16**: 414–417. N. 1898.

Atkinson, G. F., & Stoneman, B. A provisional Key to the Genera of Hymenomycetes. (Mushrooms, Toadstools, etc.) 1–16. 6 O. 1898.

Baker, J. G. *Calochortus clavatus.* Curt. Bot. Mag. **54**: *pl. 7606.* Jl. 1898.
Native of California.

Barton, E. S. On the Fruit of *Chroospora fastigiata* J. Ag. Journ. Linn. Soc. **33**: 507, 508. *pl. 28.* 1 N. 1898.

Beal, W. J. Some unique Examples of Dispersion of Seeds and Fruits. Am. Nat. **32**: 859–866. N. 1898.

Beal, W. J. How Plants flee from their Enemies. Plant World, **1**: 26–28; 42–44. N., D. 1897.

Beecher, C. E. The Origin and Significance of Spines. Am. Jour. Sci. IV. **6**: 1–20, 125–136, 249–268, 329–359. *f. 1–73.* Je.–O. 1898.
Primarily zoölogical but also treating of plant spines.

Bessey, E. A. The comparative Morphology of the Pistils of the Ranunculaceae, Alismaceae and Rosaceae. Bot. Gaz. **26**: 297–313. *pl. 25.* N. 1898.

Bessey, C. E. Botanical Notes. A southern Fern far from Home. Science, II. **8**: 587, 588. 28 O. 1898.

Bessey, C. E. Botanical Notes. A tiny Pine Tree. Science, II. **8**: 588. 28 O. 1898.

Bessey, C. E. A vegetable Awl. Plant World, **1**: 132. Je. 1898. [Illust.]

Bessey, C. E. Report upon the Progress of the Botanical Survey of Nebraska. Plant World, **1**: 103–105. Ap. 1898.

Bibbins, A. A fossil Cypress Swamp in Maryland. Plant World, **1**: 164–166. Au. 1898.

Britton, E. G. A hybrid Moss. Plant World, **1**: 138. Je. 1898.

Britton, E. G. The Adder's Tongue Ferns. Plant World, **1**: 85–89. *f. 1–7.* Mh. 1898.

Britten, J. Bibliographical Notes.—XVI. Fabricius' "Enumeratio Plantarum Horti Helmstadiensis." Jour. Bot. **36**: 397–399. O. 1898.

Britten, J. Dedication of *Jacksonia* Raf. Jour. Bot. **36**: 399, 400. O. 1898.

Buchenau, F. *Luzula campestris* und verwandte Arten. Oestr. Bot. Zeitschr. **48**: 161–167; 209–220; 243–251; 284–297. *pl. 7.* My. Je. Jl. Au. 1898.

Chesnut, V. K. The stinging Nettles. Plant World, **1**: 116, 117. My. 1898.

Clute, W. N. The Flora of the Upper Susquehanna and its Tributaries. 12mo. 1–142. 1898.

Clute, W. N. The Ferns and Fern Allies of the Upper Susquehanna Valley. 12mo. 1–15. 1898.

Cockerell, T. D. A. Preliminary Note on the Growth of Plants in Gypsum. Science, II. **8**: 119–121. 29 Jl. 1898.

Combs, R. Histology of the Corn Leaf. Rep. Iowa Acad. Sci. **5**:—(6–10). *pl. 9–11. f. 11–13.* 1898.

Copeland, E. B. A new self-registering Transpiration Machine. Bot. Gaz. **26**: 343–348. N. 1898. [Illust.]

Coulter, J. M. The Origin of Gymnosperms and the Seed Habit. Science, II. **8**: 377–385. 23 S. 1898.

Crawford, J. The Twayblade in Cultivation. Plant World, **1**: 91, 92. M. 1898. [Illust.]

Davis, J. J. A graminicolous Doassansia. Bot. Gaz. **26**: 353, 354. N. 1898.

D. zizaniae sp. nov.

Davy, J. B. *Stapfia*, a new Genus of Meliceae and other noteworthy Grasses. Erythea, **6**: 109–113. *pl. 3.* 8 N. 1898.

Stapfia Colusana Davy, gen. et. sp. nov.

De Candolle, C. Piperaceae Bolivianae. Bull. Torr. Bot. Club, **25**: 566–572. 7 N. 1898.

Contains descriptions of several new species in *Piper* and *Piperonia*.

Dudley, W. R. Forest Reservations; with a report on the Sierra Reservation, California. Sierra Club Bull. **1**: 254–267. Ja. 1896.

Eastwood, A. Plants in Flower in November and December, 1897. Erythea, **6**: 114, 115. 8 N. 1898.

Eckles, C. H. The Relation of certain Bacteria to the Production of Butter. Centralb. für Bact. Paras. und Infek. **4**: 730–734; 759–763. 1898.

Engler, A. Beiträge zur Kenntniss der Araceae, VIII. Bot. Jahrb., **25**: 352–476. 19 Jl. 1898.

Evans, A. W. Studies among our common Hepaticae. Plant World, **1**: 97–102. *f. 1–15*; 133–137. *f. 1–21*; 182–186. *f. 1–15*. Ap. Je. S. 1898.

Evermann, B. W. The Teaching of Biology in the Public Schools. Plant World, **1**: 119–122. My. 1898.

Farlow, W. G. The Conception of Species as affected by recent Investigations on Fungi. Science, II. **8**: 423–435. 30 S. 1898.

Golden, K. E. Yeasts and their Properties. Purdue Univ. Monog. (Food) **5**: 1–28. *f. 1–8*. [1898.]

Greene, E. L. Parthenogenesis in common Plants. Plant World, **1**: 102, 103. Ap. 1898.

Halsted, B. D. Starch Distribution as affected by Fungi. Bull. Torr. Bot. Club, **25**: 573–579. 7 N. 1898.

Harshberger, J. W. Botanical Observations on the Mexican Flora, especially on the Flora of the Valley of Mexico. Proc. Acad. Nat. Sci. Phila. **1898**: 372–413. S. 1898.

Harvard, V. The vulgar or English names of Plants. Plant World, **1**: 161–163; 180–182. Au. S. 1898.

Hasse, H. E. Lichens of Southern California. 1–18. 1898. [2d ed.]

Heller, A. A. New and Interesting plants from western North America.—III. Bull. Torr. Bot. Club, **25**: 580–582. 7 N. 1898.

Hydrophyllum tenuipes, sp. nov.; previously described varieties in *Salix*, *Corylus*, *Ranunculus*, *Opulaster*, *Kalmia* and *Stachys*, raised to specific rank.

Hemsley, W. B. *Lucuma Hartii*. Hook. Ic. Pl. **26**: *pl. 2565*. Ap. 1898.

A species from Trinidad, W. I.

Hemsley, W. B. *Hevea spurceana*. Hook. Ic. Pl. **26**: *pl. 2570*. Ap. 1898.

Notes on a north Brazilian species with the description of a new species, *H. confusa*, from British Guiana.

Hemsley, W. B. *Hevea Benthamiana*. Hook. Ic. Pl. **26**: *pl. 2571*. Ap. 1898.

A north Brazilian species.

Hemsley, W. B. *Hevea minor*. Hook. Ic. Pl. **26**: *pl. 2572*. Ap. 1898.

A new species from north Brazil.

Hemsley, W. B. Heveae Specierum plurium analyses. Hook. Ic. Pl. **26**: *pl. 2573, 2574.* Ap. 1898.
Enumeration of eight species of *Hevea.*

Hemsley, W. B. Heveae Specierum plurium semina. Hook. Ic. Pl. **26**: *pl. 2575.* Ap. 1898.

Hemsley, W. B., and **Rose, J. N.** *Loeselia cordiflora.* Hook. Ic. Pl. **26**: *pl. 2551.* Ap. 1898.
A new species, collected by Palmer at Tepic, Jalisco, Mexico, in 1862.

Hemsley, W. B. *Loeselia involucrata.* Hook. Ic. Pl. **26**: *pl. 2552.* Ap. 1898.
A Mexican species.

Hemsley, W. B. *Passiflora fuchsiiflora.* Hook. Ic. Pl. **26**: *pl. 2553.* Ap. 1898.
A species from the Demerara river, British Guiana.

Hill, E. J. The Extent of Dodder Parasitism. Plant World, **1**: 123, 124. My. 1898.

Hill, E. J. A Peach with a double Plumule. Plant World, **1**: 190. S. 1898.

Hinche, C. L. Among Colorado's Wild Flowers. Plant World, **1**: 170–172. Au. 1898.

Hooker, J. D. *Philadelphus Mexicanus.* Curt. Bot. Mag. **54**: *pl. 7600.* Je. 1898.
Native of Mexico and Guatemala.

Hooker, J. D. *Ribes villosum.* Curt. Bot. Mag. **54**: *pl. 7611.* Au. 1898.
Native of Chili.

Hooker, J. D. *Calliandra fulgens.* Curt. Bot. Mag. **54**: *pl. 7626.* N. 1898.
Native of Mexico.

Hooker, J. D. *Amelanchier Canadensis* Medic. var. *oblongifolia.* Curt. Bot. Mag. **54**: *pl. 7619.* O. 1898.
Native of Eastern North America.

Hooker, J. D. *Cortaderia jubata.* Curt. Bot. Mag. **54**: *pl. 7607.* Au. 1898.
Native of the Andes.

Hooker, J. D. *Sedum glandulosum.* Curt. Bot. Mag. **54**: *pl. 7610.* Au. 1898.
Native of California and British Columbia.

Hopkins, C. G. The Chemistry of the Corn Kernel. Bull. Ill. Agric. Exper. Sta. Bull. **53**: 129–180. Jl. 1898.

Jepson, W. L. Dr. Henry N. Bolander, Botanical Explorer. Erythea, **6**: 100–107. *pl. 2.* 24 O. 1898.

Jepson, W. L. *Beckwithia*, a new Genus of Ranunculaceae. Erythea, **6**: 97–99. *pl. 1.* 24 O. 1898.

Beckwithia Andersonii (Gray) Jepson (*Beckwithia Austinae* Jepson *l. c.*).

Kalbfleisch, A. S. Orchids on Long Island. Plant World, **1**: 177–179. S. 1898.

Kearney, T. H., Jr. The Liana Vegetation of Southeastern Virginia. Plant World, **1**: 169, 170. Au. 1898.

Kearney, T. H., Jr. The Pine-Barren Flora in the East Tennessee Mountains. Plant World, **1**: 33–35. D. 1897.

Klausenburg, B. Pater-. Eine Beobachtung über *Puccinia malvacearum* Mont. Zeitschr. Pflanzenkr. **8**: 201, 202. 29 O. 1898.

Knowlton, F. H. The Elephant Tree. Plant World, **1**: 113–116. *pl. 5.* My. 1898.

Lawson, A. A. New Method of making Botanical Charts. Erythea, **6**: 113, 114. 8 N. 1898.

Lister, A. Mycetozoa of Antigua. Jour. Bot. **36**: 378, 379. O. 1898.

Lloyd, C. G. Mycological Notes. 1–8. N. 1898.

Macbride, T. H. A Pre-Kansan Peat Bed. Rep. Iowa Acad. Sci., **4**: 63–66. 1897.

Macmillan, C. *Cordyceps stylophora* Berk. & Br. in Minnesota. Bull. Torr. Bot. Club, **25**: 583. 7 N. 1898.

Macoun, W. T. List of Species of Maples growing at the Centra Experimental Farm, Ottawa. Ottawa Nat. **12**: 133–136. N. 1898

Miller, C. O. The aseptic Cultivation of Mycetozoa. Quar. Jour. Mic. Sci. **41**: 43–71. *pl. 6, 7.* Mh. 1898.

Müller, C. Analecta bryographica Antillarum. Hedwigia, **37**: 219–224. 20 Jl. 1898; 225–266. 25 O. 1898.

Includes numerous new species.

Münderlein, P. Ueber Equisetum-Formen. Deutsch. Bot. Monat. **16**: 57–59; 101–104; 121–124. Ap. Je. Jl. 1898.

Nash, G. V. Revision of the Genus *Triplasis*. Bull. Torr. Bot. Club, **25**: 561–565. 7 N. 1898.

Contains detailed descriptions of the three species; *Triplasis Americana*, sp. nov.

Paddock, W. An Apple Canker. Science, II. **8**: 595, 596. 28 O. 1898.

Pammel, L. H. Comparative Anatomy of the Corn Caryopsis. Rep. Iowa Acad. Sci. **5**:—(1–5). *f. 5–10.* 1898.

Pammel, L. H., Burnip, J. R., & Thomas, H. Some Studies on the Seeds and Fruits of Berberidaceae. Rep. Iowa Acad. Sci. **5**:—(11–25). *pl. 12–16. f. 14.* 1898.

Prunet, M. A. Recherches sur le black rot de la vigne. Rev. Gen. Bot. **10**: 404–410. 15 O. 1898.

Pfitzer, E. Beiträge zur Systematik der Orchideen.—II. Bot. Jahrb. **25**: 517–546. 1898.

Pierre, L. Observations sur quelques Landolphiées. Bull. Men. Soc. Linn. Paris. **1898**: 33–40. My. 1898.

Pilger, R. Vergleichende Anatomie der Gattung *Plantago* mit Rücksicht auf die Existenzbedingungen. Bot. Jahrb. **25**: 296–336; 337–351. 19 Jl. 1898.

Pollard, C. L. The Families of Flowering Plants. Plant World, **1**: 5, 6; 19, 20; 37, 38; 56–58; 89–91. O. N. D. 1897. Ja. F. 1898.

Pollard, C. L. Further Observations on the Eastern acaulescent Violets. Bot. Gaz. **26**: 325–342. N. 1898. [Illust.]
V. insignis sp. nov.

Putnam, H. L. Fertilization of the Crimson Thread-Flower (*Poinciana Gillesii*). Plant World, **1**: 39–40. *f. 1–3.* D. 1897.

Riddle, L. C. The Embryology of *Alyssum.* Bot. Gaz. **26**: 314–324. *pl. 26–28.* N. 1898.

Robinson, A. G. Blue Ridge Blossoms. Plant World, **1**: 130, 131; 145–147. Je. Jl. 1898.

Rowlee, W. W. & Hastings, G. T. The Seeds and Seedlings of some Amentiferae. Bot. Gaz. **26**: 349–353. *pl. 29.* N. 1898.

Sablon, L. du. Recherches sur les reserves Hydrocarbonées des Bulbes et des Tuberailes. Rev. Gen. Bot. **10**: 385–403. *f. 71–74.* 15 O. 1898.

Salmon, E. S. A Revision of the Genus *Symblepharis* Montagne. Jour. Linn. Soc. **33**: 486–501. *pl. 26.* 1 N. 1898.

Sanders, C. F. *Smilax glauca* in Winter. Plant World, **1**: 105, 106. Ap. 1898.

Sanders, C. F. The evening Lychnis. Plant World, **1**: 150, 151. Je. 1898.

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